

Design Brief: Title: Design, make and evaluate a monster box for the year 4s to use for the Christmas play

End Point Knowledge and Skills – DESIGN

- Generate realistic and appropriate ideas and design criteria through discussion, focusing on the needs of the user.
- Use annotated sketches and prototypes to develop, model and communicate ideas.

End Point Knowledge and Skills – MAKE

- Order the main stages of making.
- Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.
- Select from and use finishing techniques suitable for the product to be created.

End Point Knowledge and Skills – EVALUATE

- Investigate and analyse books, videos and products with pneumatic mechanisms.
- Evaluate products and ideas against criteria and user needs, as designing and making.

Technical Knowledge and Understanding

- Understand and use pneumatic mechanisms.
- Know and use technical vocabulary relevant to the project.

Key Vocabulary

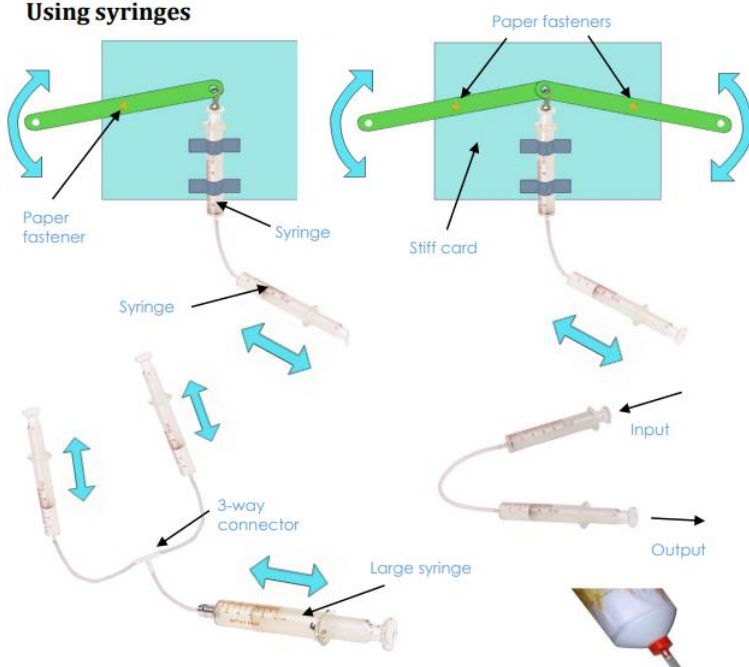
components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight linear, rotary, oscillating, reciprocating user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate

Glossary

- **Compressed** – something that is squashed, such as air in a tube.
- **Input** – what goes into a system.
- **Output** – what comes out of a system.
- **Pivot** – a point about which a lever turns.
- **Lever** – a beam which turns about a point.
- **Pneumatic** – a system that works using gases (air).
- **Hydraulic** – a system that works using liquids (water).
- **Pressure** – the force used on an object or surface.

- **Inflate** – fill something with air or a gas to make it swell up.
- **Deflate** – remove the pressurised air to allow an object like a balloon to shrink.
- **Syringe** – a tube with a nozzle and plunger for sucking and blowing air or liquids.
- **System** – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a pneumatic system, the 'input movement' is where the user pushes or pulls a syringe or pump. The 'output movement' is where the object at the end of the tube moves.

Using syringes



Squeeze the bottle (input movement) to inflate the balloon (output movement) and raise the toy.

